What is Claimed is:

1. A method of fabricating optical microstructures comprising:

rotating a cylindrical platform that includes a radiation sensitive layer thereon about an axis thereof; while

simultaneously axially rastering a radiation beam across at least a portion of the radiation sensitive layer to image the optical microstructures in the radiation sensitive layer.

2. A method according to Claim 1 further comprising:

simultaneously continuously translating the cylindrical platform and/or radiation beam axially relative to one another, to image the optical microstructures in a spiral pattern in the radiation sensitive layer.

3. A method according to Claim 1 further comprising:

simultaneously stepwise translating the cylindrical platform and/or radiation beam axially relative to one another, to image the optical microstructures in a band pattern in the radiation sensitive layer.

4. A method according to Claim 3 wherein simultaneously stepwise translating comprises stepwise translating the cylindrical platform and/or radiation beam axially relative to one another at a predetermined rotation angle of the cylindrical platform to image the optical microstructures in an aligned band pattern in the radiation sensitive layer.

5. A method according to Claim 3 wherein simultaneously stepwise translating comprises stepwise translating the cylindrical platform and/or radiation beam axially relative to one another at staggered rotation angles of the cylindrical platform to image the optical microstructures in a staggered band pattern in the radiation sensitive layer.

6. A method according to Claim 1 wherein simultaneously axially rastering comprises simultaneously axially rastering a radiation beam across at least a portion of the radiation sensitive layer while varying amplitude of the radiation beam to image the optical microstructures in the radiation sensitive layer.

7. A method according to Claim 1 wherein simultaneously axially rastering comprises simultaneously axially rastering a radiation beam across at least a portion of the radiation sensitive layer while continuously varying amplitude of the radiation beam to image the optical microstructures in the radiation sensitive layer.

8. A method according to Claim 1 wherein simultaneously axially rastering a radiation beam comprises simultaneously axially rastering a laser beam.

9. A method according to Claim 8 wherein simultaneously axially rastering a laser beam comprises:

generating a continuous wave laser beam;

modulating the laser beam to vary an amplitude thereof; and

oscillating the laser beam to raster the laser beam across at least a portion of the radiation sensitive layer.

10. A method according to Claim 1 wherein simultaneously axially rastering is performed at sufficient speed, relative to rotating, such that the radiation beam images an optical microstructure over a plurality of scans of the radiation beam.

11. A method according to Claim 1 further comprising:

simultaneously varying a focal length of the radiation beam to at least partially compensate for radial variation in the cylindrical platform and/or thickness variation in the radiation sensitive layer.

12. A method according to Claim 1 further comprising:

simultaneously varying a focal length of the radiation beam to image portions of the optical microstructures at varying depths in the radiation sensitive layer.

13. A method according to Claim 1 wherein simultaneously axially rastering comprises:

simultaneously axially rastering a radiation beam along first and second opposite axial directions across at least a portion of the radiation sensitive layer to

image the optical microstructures in the radiation sensitive layer along both the first and the second opposite axial directions.

14. A method according to Claim 1 wherein simultaneously axially rastering comprises:

simultaneously axially rastering a radiation beam along first and second opposite axial directions across at least a portion of the radiation sensitive layer to image the optical microstructures in the radiation sensitive layer along the first axial direction and to blank the radiation beam along the second axial direction.

15. A method according to Claim 1 wherein the cylindrical platform is at least about one foot in circumference and/or at least about one foot in axial length.

16. A method according to Claim 15 wherein rotating is performed at angular velocity of at least about 1 revolution per minute.

17. A method according to Claim 16 wherein simultaneously axially rastering is performed at frequency of at least about 1 kHz.

18. A method according to Claim 1 wherein rotating and simultaneously axially rastering are performed continuously for at least about 1 hour.

19. A method according to Claim 18 wherein rotating and simultaneously axially rastering are performed continuously for at least about 1 hour to fabricate at least about one million optical microstructures.

20. A method according to Claim 1 wherein the optical microstructures comprise microlenses.

21. A method according to Claim 1 further comprising:

developing the optical microstructures that are imaged in the radiation sensitive layer to provide an optical microstructure master.

22. A method according to Claim 1 wherein the cylindrical platform also includes a substrate on the radiation sensitive layer that is transparent to the radiation beam and wherein simultaneously axially rastering comprises simultaneously axially rastering a radiation beam through the substrate that is transparent thereto across at least a portion of the radiation sensitive layer to image the optical microstructures in the radiation sensitive layer.

23. A method according to Claim 22 wherein the radiation sensitive layer is a negative photoresist layer such that portions of the negative photoresist layer that are exposed to the radiation beam remain after development.

24. A method according to Claim 1 wherein the radiation sensitive layer is a negative photoresist layer such that portions of the negative photoresist layer that are exposed to the radiation beam remain after development.

25. A method according to Claim 22 wherein the substrate is a flexible substrate.

26. A method according to Claim 1 wherein rotating comprises:

rotating a cylindrical platform that includes thereon a radiation sensitive layer sandwiched between a pair of outer layers about an axis thereof.

27. A method according to Claim 26 wherein simultaneously axially rastering is followed by:

removing at least one of the outer layers.

28. A method according to Claim 26 wherein the pair of outer layers comprises a first outer layer adjacent the cylindrical platform and a second outer layer remote from the cylindrical platform that is transparent to the radiation beam, and wherein simultaneously axially rastering comprises simultaneously axially rastering the radiation beam through the second outer layer across at least a portion of the radiation sensitive layer to image the optical microstructures in the radiation sensitive layer.

29. A method according to Claim 28 wherein the radiation sensitive layer is a negative photoresist layer.

30. A method according to Claim 27 wherein the removing comprises:

separating the first outer layer from the cylindrical platform; and

separating the first outer layer from the radiation sensitive layer.

31. A method of fabricating optical microstructures comprising:

rotating a cylindrical platform that includes a radiation sensitive layer thereon about an axis thereof; while

simultaneously axially rastering a laser beam across at least a portion of the radiation sensitive layer while continuously varying amplitude of the laser beam; and while

simultaneously translating the cylindrical platform and/or laser beam axially relative to one another, to image the optical microstructures in the radiation sensitive layer.

32. A method according to Claim 31 wherein simultaneously axially rastering is performed at sufficient speed, relative to rotating, such that the laser beam images an optical microstructure over a plurality of scans of the laser beam.

33. A method according to Claim 31 further comprising:

simultaneously varying a focal length of the laser beam.

34. A method according to Claim 33 wherein simultaneously axially rastering comprises:

simultaneously axially rastering a laser beam along first and second opposite axial directions across at least a portion of the radiation sensitive layer to image the optical microstructures in the radiation sensitive layer along the first axial direction and to blank the laser beam along the second axial direction.

35. A method according to Claim 34 wherein the cylindrical platform is at least about one foot in circumference and/or at least about one foot in axial length.

36. A method according to Claim 35 wherein rotating and simultaneously axially rastering are performed continuously for at least about 1 hour to fabricate at least about one million optical microstructures.

37. A method according to Claim 36 wherein the optical microstructures comprise microlenses.

38. A method according to Claim 37 further comprising:

developing the microlenses that are imaged in the radiation sensitive layer to provide a microlens master.

39. A method according to Claim 31 wherein the radiation sensitive layer is a negative photoresist layer such that portions of the negative photoresist layer that are exposed to the radiation beam remain after development; and

wherein the cylindrical platform also includes a substrate on the negative photoresist layer that is transparent to the laser beam and wherein simultaneously axially rastering comprises simultaneously axially rastering a laser beam through the substrate that is transparent thereto across at least a portion of the negative photoresist layer to image the optical microstructures in the negative photoresist layer.

40. A method according to Claim 39 wherein the cylindrical platform also includes a release layer between the negative photoresist layer and the cylindrical platform.

41. A system for fabricating optical microstructures comprising:

a cylindrical platform that is configured to hold a radiation sensitive layer thereon;

a radiation beam system that is configured to impinge a radiation beam upon the radiation sensitive layer on the cylindrical platform; and

a controller that is configured to rotate the cylindrical platform about an axis thereof while simultaneously axially rastering the radiation beam across at least a portion of the radiation sensitive layer to image the optical microstructures in the radiation sensitive layer.

42. A system according to Claim 41 wherein the controller is further configured to simultaneously continuously translate the cylindrical platform and/or radiation beam axially relative to one another, to image the optical microstructures in a spiral pattern in the radiation sensitive layer.

43. A system according to Claim 41 wherein the controller is further configured to simultaneously stepwise translate the cylindrical platform and/or radiation beam axially relative to one another, to image the optical microstructures in a band pattern in the radiation sensitive layer.

44. A system according to Claim 43 wherein the controller is configured to simultaneously stepwise translate by stepwise translating the cylindrical platform and/or radiation beam axially relative to one another at a predetermined rotation angle of the cylindrical platform to image the optical microstructures in an aligned band pattern in the radiation sensitive layer.

45. A system according to Claim 43 wherein the controller is configured to simultaneously stepwise translate by stepwise translating the cylindrical platform and/or radiation beam axially relative to one another at staggered rotation angles of the cylindrical platform to image the optical microstructures in a staggered band pattern in the radiation sensitive layer.

46. A system according to Claim 41 wherein the controller is configured to simultaneously axially raster the radiation beam across at least a portion of the radiation sensitive layer while varying amplitude of the radiation beam to image the optical microstructures in the radiation sensitive layer.

47. A system according to Claim 41 wherein the controller is configured to simultaneously axially raster the radiation beam across at least a portion of the radiation sensitive layer while continuously varying amplitude of the radiation beam to image the optical microstructures in the radiation sensitive layer.

48. A system according to Claim 41 wherein the radiation beam is a laser beam.

49. A system according to Claim 48 wherein the radiation beam system comprises:

a continuous wave laser beam; and

a modulator that is configured to modulate the amplitude of the laser beam and to oscillate the laser beam to raster the laser beam across at least a portion of the radiation sensitive layer.

50. A system according to Claim 41 wherein the controller is configured to rotate the cylindrical platform while simultaneously axially rastering the radiation beam at sufficient speed, relative to rotating, such that the radiation beam images an optical microstructure over a plurality of scans of the radiation beam.

51. A system according to Claim 41 wherein the radiation beam system further comprises an auto focus system that is configured to vary a focal length of the radiation beam to at least partially compensate for radial variation in the cylindrical platform and/or thickness variation in the radiation sensitive layer.

52. A system according to Claim 41 wherein the radiation beam system further comprises an auto focus system that is configured to simultaneously vary a focal length of the radiation beam to image portions of the optical microstructures at varying depths in the radiation sensitive layer.

53. A system according to Claim 41 wherein the controller is further configured to simultaneously axially raster the radiation beam along first and second opposite axial directions across at least a portion of the radiation sensitive layer to image the optical microstructures in the radiation sensitive layer along both the first and the second opposite axial directions.

54. A system according to Claim 41 wherein the controller is further configured to simultaneously axially raster the radiation beam along first and second opposite axial directions across at least a portion of the radiation sensitive layer to image the optical microstructures in the radiation sensitive layer along the first axial direction and to blank the radiation beam along the second axial direction.

55. A system according to Claim 41 wherein the cylindrical platform is at least about one foot in circumference and/or at least about one foot in axial length.

56. A system according to Claim 55 wherein the cylindrical platform is rotated at angular velocity of at least about 1 revolution per minute.

57. A system according to Claim 56 wherein the rastering is performed at frequency of at least about 1 kHz.

18. A system according to Claim 41 wherein the controller is configured to control rotation of the cylindrical platform and axial rastering of the radiation beam continuously for at least about 1 hour.

59. A system according to Claim 58 wherein the controller is configured to control rotation of the cylindrical platform and axial rastering of the radiation beam continuously for at least about 1 hour to fabricate at least about one million optical microstructures.

60. A system according to Claim 41 wherein the optical microstructures comprise microlenses.

61. A system according to Claim 41 further comprising:

a developing station that is configured to develop the optical microstructures that are imaged in the radiation sensitive layer to provide a master for optical microstructures.

62. A system according to Claim 41 wherein the cylindrical platform also is configured to hold thereon the radiation sensitive layer and a substrate on the radiation sensitive layer that is transparent to the radiation beam, and wherein the controller is further configured to axially raster the radiation beam through the substrate that is transparent thereto across at least a portion of the radiation sensitive layer to image the optical microstructures in the radiation sensitive layer.

63. A system according to Claim 62 wherein the radiation sensitive layer is a negative photoresist layer such that portions of the negative photoresist layer that are exposed to the radiation beam remain after development.

64. A system according to Claim 41 wherein the radiation sensitive layer is a negative photoresist layer such that portions of the negative photoresist layer that are exposed to the radiation beam remain after development.

65. A system according to Claim 62 wherein the substrate is a flexible substrate.

66. A system according to Claim 1 wherein the cylindrical platform is configured to hold thereon the radiation sensitive layer sandwiched between a pair of outer layers.

67. A system for fabricating optical microstructures comprising:

a cylindrical platform that is configured to hold a radiation sensitive layer thereon;

a laser beam system that is configured to impinge a laser beam upon the radiation sensitive layer on the cylindrical platform; and

a controller that is configured to rotate the cylindrical platform about an axis thereof while simultaneously axially rastering the laser beam across at least a portion of the radiation sensitive layer, while continuously varying amplitude of the laser beam and while simultaneously translating the cylindrical platform and/or laser beam axially relative to one another, to image the optical microstructures in the radiation sensitive layer.

68. A system according to Claim 67 wherein the controller is configured to rotate the cylindrical platform while simultaneously axially rastering the laser beam at sufficient speed, relative to rotating, such that the laser beam images an optical microstructure over a plurality of scans of the laser beam.

69. A system according to Claim 68 wherein the laser beam system further comprises an auto focus system that is configured to vary a focal length of the laser beam.

70. A system according to Claim 69 wherein the controller is further configured to simultaneously axially raster the laser beam along first and second opposite axial directions across at least a portion of the radiation sensitive layer to image the optical microstructures in the radiation sensitive layer along the first axial direction and to blank the laser beam along the second axial direction.

71. A system according to Claim 70 wherein the cylindrical platform is at least about one foot in circumference and/or at least about one foot in axial length.

72. A system according to Claim 71 wherein the controller is configured to control rotation of the cylindrical platform and axial rastering of the laser beam continuously for at least about 1 hour to fabricate at least about one million optical microstructures.

73. A system according to Claim 72 wherein the optical microstructures comprise microlenses.

74. A system according to Claim 73 further comprising:

a developing station that is configured to develop the microlenses that are imaged in the radiation sensitive layer to provide a microlens master.

75. A system according to Claim 74 wherein the radiation sensitive layer is a negative photoresist layer such that portions of the negative photoresist layer that are exposed to the laser beam remain after development; and

wherein the cylindrical platform also is configured to hold a substrate on the negative photoresist layer that is transparent to the laser beam and wherein the controller is further configured to axially raster the laser beam through the substrate that is transparent thereto across at least a portion of the negative photoresist layer to image the optical microstructures in the negative photoresist layer.